

SEQUENCE LISTING

<110> The United States of America as Represented by the Secretary of the Department of Health and Human Services, Centers for Disease Control and Prevention

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Steiner, Bret  
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<120> COMPOSITIONS AND METHODS FOR DETECTING TREPONEMA PALLIDUM

<130> 6395-61666

<150> PCT/US00/16425

<151> 2000-06-14

<150> US 60/138,981

<151> 1999-06-14

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<170> PatentIn version 3.1

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Leu	Gly	Thr	Val	Arg	Gly	Gly	Ser	Gln	Thr	Ser	Gln	Asp	Gly	Leu	Ser	
					65			70			75		80			
Leu	Ala	Ser	Leu	Pro	Ser	Arg	Val	Pro	Ala	Arg	Pro	Ala	Gln	Arg	Asp	
					85			90			95					
Pro	Leu	Ser	Ser	Pro	Pro	Ala	Gly	His	Thr	Val	Pro	Glu	Tyr	Arg	Asp	
					100			105			110					

Thr Val Ile Phe Asp Asp Pro Arg Leu Val Ser Pro Leu Ser Arg Glu  
115 120 125

Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly  
130 135 140

Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser  
145 150 155 160

Glu Arg Glu Gly Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val  
165 170 175

Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg Glu Val Glu Asp Val  
180 185 190

Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg Glu  
195 200 205

Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly  
210 215 220

Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser  
225 230 235 240

Glu Arg Glu Gly Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val  
245 250 255

Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg Glu Val Glu Asp Val  
260 265 270

Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg Glu  
275 280 285

Val Ala Ser Gln His Thr Lys Gln Pro Ser His Ser Val Ser Asn Ser  
290 295 300

Ala Pro Asn Gln Phe Arg Lys Pro  
305 310

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<213> Treponema pallidum

<400> 7

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Pro Ala Ser

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<212> PRT  
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<400> 8

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1 5 10 15

Arg Glu Gly Gly  
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<211> 20  
<212> PRT  
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<400> 9

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1 5 10 15

Val Glu Asp Ala  
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<210> 10  
<211> 21  
<212> PRT  
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<400> 10

Pro Lys Asn Thr Ala Val Glu Ile Ser Asn Leu Glu Lys Asn Ala Lys  
1 5 10 15

Ala Gln Ala Val Val  
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<210> 11  
<211> 25  
<212> PRT  
<213> Treponema pallidum

<400> 11

Gly His Ala Gly Ile Pro Gly Leu Leu Val Ser Leu Ala Pro Ala Ala

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15

Ala Ala Gln Leu Gly Ile Gly Val Tyr  
20 25

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<400> 12

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1 5 10 15

Gly His Thr Val Pro Glu Tyr Arg Asp  
20 25

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<400> 13

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1 5 10 15

Asp Val Pro Lys Val  
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<211> 26  
<212> PRT  
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<400> 14

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Ser Gln His Thr Lys Gln Pro Ser His Ser  
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<400> 15

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1 5 10 15

Gly Gly Glu Arg  
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<400> 16

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1 5 10 15

Gly Gly Glu Arg  
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<210> 17  
<211> 20  
<212> PRT  
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<400> 17

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1 5 10 15

Gly Gly Glu Arg  
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<210> 18  
<211> 20  
<212> PRT  
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<400> 18

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1 5 10 15

Gly Gly Glu Arg  
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<210> 19  
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<212> DNA  
<213> Treponema pallidum

<220>  
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<222> (1)..(1647)  
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<220>  
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1	5	10	15
agc aac tta gaa aag aat gcc aag gct cag gca gtg gtt att ggg cac		96	
Ser Asn Leu Glu Lys Asn Ala Lys Ala Gln Ala Val Val Ile Gly His			
20	25	30	
gca ggg atc ccc ggt ctt cta gtt agc ctt gca ccc gct gct gca gca		144	
Ala Gly Ile Pro Gly Leu Leu Val Ser Leu Ala Pro Ala Ala Ala Ala			
35	40	45	
cag ctt ggg att ggc gta tac caa gct gtg cgt gta cgc gta cgt acc		192	
Gln Leu Gly Ile Gly Val Tyr Gln Ala Val Arg Val Arg Val Arg Thr			
50	55	60	
ttg ggt acc gtg cgc ggt ggg tct caa aca agt cag gac gga ctg tcc		240	
Leu Gly Thr Val Arg Gly Ser Gln Thr Ser Gln Asp Gly Leu Ser			
65	70	75	80
ctt gca tct ttg ccg tcc cgt gtg cct gcg cgc ccc gcg cag cgt gat		288	
Leu Ala Ser Leu Pro Ser Arg Val Pro Ala Arg Pro Ala Gln Arg Asp			
85	90	95	
cct ctg tca tcc ccg ccg gca ggt cac act gta ccg gaa tat cgc gat		336	
Pro Leu Ser Ser Pro Pro Ala Gly His Thr Val Pro Glu Tyr Arg Asp			
100	105	110	
acg gtt att ttc gat gac ccg cgt ttg gtt tcc cct ttg tct cgt gag		384	
Thr Val Ile Phe Asp Asp Pro Arg Leu Val Ser Pro Leu Ser Arg Glu			
115	120	125	
gtg gag gac gcg ccg aag gta gtg gag ccg gcc tct gag cgt gag gga		432	
Val Glu Asp Ala Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly			
130	135	140	
ggg gag cgt gag gtg gag gac gcg ccg aag gta gtg gag ccg gcc tct		480	
Gly Glu Arg Glu Val Glu Asp Ala Pro Lys Val Val Glu Pro Ala Ser			
145	150	155	160
gag cgt gag gga ggg gag cgt gag gtg gag gac gtg ccg aag gta gtg		528	
Glu Arg Glu Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val			
165	170	175	
gag ccg gcc tct gag cgt gag gga ggg gag cgt gag gtg gag gac gcg		576	
Glu Pro Ala Ser Glu Arg Glu Gly Glu Arg Glu Val Glu Asp Ala			
180	185	190	
ccg aag gta gtg gag ccg gcc tct gag cgt gag gga ggg gag cgt gag		624	
Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly Glu Arg Glu			
195	200	205	
gtg gag gac gtg ccg aag gta gtg gag ccg gcc tct gag cgt gag gga		672	
Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly			

210	215	220	
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gag cgt gag gga ggg gag cgt gag gtg gag gac gcg ccg aag gta gtg Glu Arg Glu Gly Glu Arg Glu Val Glu Asp Ala Pro Lys Val Val 245 250 255			768
gag ccg gcc tct gag cgt gag gga ggg gag cgt gag gtg gag gac gcg Glu Pro Ala Ser Glu Arg Glu Gly Glu Arg Glu Val Glu Asp Ala 260 265 270			816
ccg aag gta gtg gag ccg gcc tct gag cgt gag gga ggg gag cgt gag Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly Glu Arg Glu 275 280 285			864
gtg gag gac gtg ccg aag gta gtg gag ccg gcc tct gag cgt gag gga Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly 290 295 300			912
ggg gag cgt gag gtg gag gac gtg ccg aag gta gtg gag ccg gcc tct Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser 305 310 315 320			960
gag cgt gag gga ggg gag cgt gag gtg gag gac gtg ccg aag gta gtg Glu Arg Glu Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val 325 330 335			1008
gag ccg gcc tct gag cgt gag gga ggg gag cgt gag gtg gag gac gtg Glu Pro Ala Ser Glu Arg Glu Gly Glu Arg Glu Val Glu Asp Val 340 345 350			1056
ccg aag gta gtg gag ccg gcc tct gag cgt gag gga ggg gag cgt gag Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly Glu Arg Glu 355 360 365			1104
gtg gag gac gtg ccg ggg gta gtg gag ccg gcc tct ggg cat gaa gga Val Glu Asp Val Pro Gly Val Val Glu Pro Ala Ser Gly His Glu Gly 370 375 380			1152
ggg gag cgt gag gtg gag gac gtg ccg ggg gta gtg gag ccg gcc tct Gly Glu Arg Glu Val Glu Asp Val Pro Gly Val Val Glu Pro Ala Ser 385 390 395 400			1200
ggg cat gaa gga ggg gag cgt gag gtc gct tct cag cat acg aag cag Gly His Glu Gly Glu Arg Glu Val Ala Ser Gln His Thr Lys Gln 405 410 415			1248
cca tcc cac tcg gtt tcc aac tca gct ccc aat cag ttt cgg aac cct Pro Ser His Ser Val Ser Asn Ser Ala Pro Asn Gln Phe Arg Asn Pro 420 425 430			1296
gag ggg gaa ctc ccc ttt acg ctc cct gac cta tcc gag tca gaa att Glu Gly Glu Leu Pro Phe Thr Leu Pro Asp Leu Ser Glu Ser Glu Ile 435 440 445			1344
gtg gtt ccg gag gaa cag aaa gga cgt gcg cat ccc cag gtg ata ccc Val Val Pro Glu Glu Gln Lys Gly Arg Ala His Pro Gln Val Ile Pro 450 455 460			1392

gag ggt gcg cca cgt gga ctg caa cct ggt gaa tac tac gta cag att		1440
Glu Gly Ala Pro Arg Gly Leu Gln Pro Gly Glu Tyr Tyr Val Gln Ile		
465 470 475 480		
gca gtc ttt cat gac gct atc cag gtg cag agc att gtc cac cgt tac		1488
Ala Val Phe His Asp Ala Ile Gln Val Gln Ser Ile Val His Arg Tyr		
485 490 495		
ggg gta gaa tac ccc atc gca gtg gag cag gac atc cat gaa ggt aag		1536
Gly Val Glu Tyr Pro Ile Ala Val Glu Gln Asp Ile His Glu Gly Lys		
500 505 510		
gtg cgt ttc acc gta tgc gtc ggt cct gtc caa aaa gac gaa cgc ggc		1584
Val Arg Phe Thr Val Cys Val Gly Pro Val Gln Lys Asp Glu Arg Gly		
515 520 525		
gcg gta cta gag aac ttc caa agg ttt gga ttc aag gac gcc ttt ctg		1632
Ala Val Leu Glu Asn Phe Gln Arg Phe Gly Phe Lys Asp Ala Phe Leu		
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aaa aag gcg cga tga		1647
Lys Lys Ala Arg		
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Ala Gly Ile Pro Gly Leu Leu Val Ser Leu Ala Pro Ala Ala Ala		
35 40 45		
Gln Leu Gly Ile Gly Val Tyr Gln Ala Val Arg Val Arg Val Arg Thr		
50 55 60		
Leu Gly Thr Val Arg Gly Gly Ser Gln Thr Ser Gln Asp Gly Leu Ser		
65 70 75 80		
Leu Ala Ser Leu Pro Ser Arg Val Pro Ala Arg Pro Ala Gln Arg Asp		
85 90 95		

Pro Leu Ser Ser Pro Pro Ala Gly His Thr Val Pro Glu Tyr Arg Asp  
100 105 110

Thr Val Ile Phe Asp Asp Pro Arg Leu Val Ser Pro Leu Ser Arg Glu  
115 120 125

Val Glu Asp Ala Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly  
130 135 140

Gly Glu Arg Glu Val Glu Asp Ala Pro Lys Val Val Glu Pro Ala Ser  
145 150 155 160

Glu Arg Glu Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val  
165 170 175

Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg Glu Val Glu Asp Ala  
180 185 190

Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg Glu  
195 200 205

Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly  
210 215 220

Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser  
225 230 235 240

Glu Arg Glu Gly Glu Arg Glu Val Glu Asp Ala Pro Lys Val Val  
245 250 255

Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg Glu Val Glu Asp Ala  
260 265 270

Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg Glu  
275 280 285

Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly  
290 295 300

Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser  
305 310 315 320

Glu Arg Glu Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val  
325 330 335

Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg Glu Val Glu Asp Val

340	345	350
Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg Glu		
355	360	365
Val Glu Asp Val Pro Gly Val Val Glu Pro Ala Ser Gly His Glu Gly		
370	375	380
Gly Glu Arg Glu Val Glu Asp Val Pro Gly Val Val Glu Pro Ala Ser		
385	390	395
Gly His Glu Gly Glu Arg Glu Val Ala Ser Gln His Thr Lys Gln		
405	410	415
Pro Ser His Ser Val Ser Asn Ser Ala Pro Asn Gln Phe Arg Asn Pro		
420	425	430
Glu Gly Glu Leu Pro Phe Thr Leu Pro Asp Leu Ser Glu Ser Glu Ile		
435	440	445
Val Val Pro Glu Glu Gln Lys Gly Arg Ala His Pro Gln Val Ile Pro		
450	455	460
Glu Gly Ala Pro Arg Gly Leu Gln Pro Gly Glu Tyr Tyr Val Gln Ile		
465	470	475
Ala Val Phe His Asp Ala Ile Gln Val Gln Ser Ile Val His Arg Tyr		
485	490	495
Gly Val Glu Tyr Pro Ile Ala Val Glu Gln Asp Ile His Glu Gly Lys		
500	505	510
Val Arg Phe Thr Val Cys Val Gly Pro Val Gln Lys Asp Glu Arg Gly		
515	520	525
Ala Val Leu Glu Asn Phe Gln Arg Phe Gly Phe Lys Asp Ala Phe Leu		
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Lys Lys Ala Arg		
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<210> 21  
 <211> 1047  
 <212> DNA  
 <213> Treponema pallidum  
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<221> CDS
<222> (1)..(1047)
<223>

<220>
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<223> Subspecies: pertenue (CDC-2 strain)

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1           5           10          15

agc aac tta gaa aag aat gcc aag gct cag gca gtg gtt att ggg cac      96
Ser Asn Leu Glu Lys Asn Ala Lys Ala Gln Ala Val Val Ile Gly His
20          25          30

gca ggg atc ccc ggt ctt cta gtt agc ctt gca ccc gct gct gca gca      144
Ala Gly Ile Pro Gly Leu Leu Val Ser Leu Ala Pro Ala Ala Ala Ala
35          40          45

cag ctt ggg att ggc gta tac caa gct gtg cgt gta cgc gta cgt acc      192
Gln Leu Gly Ile Gly Val Tyr Gln Ala Val Arg Val Arg Val Arg Thr
50          55          60

ttg ggt acc gtg cgc ggt ggg tct caa aca agt cag gac gga ctg tcc      240
Leu Gly Thr Val Arg Gly Ser Gln Thr Ser Gln Asp Gly Leu Ser
65          70          75          80

ctt gca tct ttg ccg tcc cgt gtg cct gcg cgc ccc gcg cag cgt gat      288
Leu Ala Ser Leu Pro Ser Arg Val Pro Ala Arg Pro Ala Gln Arg Asp
85          90          95

cct ctg tca tcc ccg gca ggt cac act gta ccg gaa tat cgc gat      336
Pro Leu Ser Ser Pro Pro Ala Gly His Thr Val Pro Glu Tyr Arg Asp
100         105         110

acg gtt att ttc gat gac ccg cgt ttg gtt tcc cct ttg tct cgt gag      384
Thr Val Ile Phe Asp Asp Pro Arg Leu Val Ser Pro Leu Ser Arg Glu
115         120         125

gtg gag gac gtg ccg aag gta gtg gag ccg gcc tct gag cgt gag gga      432
Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly
130         135         140

ggg gag cgt gag gtg gag gac gtg ccg aag gta gtg gag ccg gcc tct      480
Gly Glu Arg Glu Val Asp Val Pro Lys Val Val Glu Pro Ala Ser
145         150         155         160

gag cgt gag gga ggg gag cgt gag gtg gag gac gtg ccg aag gta gtg      528
Glu Arg Glu Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val
165         170         175

gag ccg gcc tct gag cgt gag gga ggg gag cgt gag gtg gag gac gtg      576
Glu Pro Ala Ser Glu Arg Glu Gly Glu Arg Glu Val Glu Asp Val
180         185         190

ccg aag gta gtg gag ccg gcc tct gag cgt gag gga ggg gag cgt gag      624
Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly Glu Arg Glu

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195	200	205	
gtc gct tct cag cat acg aag cag cca tcc cac tcg gtt tcc aac tca Val Ala Ser Gln His Thr Lys Gln Pro Ser His Ser Val Ser Asn Ser 210	215	220	672
gct ccc aat cag ttt cgg aac cct gag ggg gaa ctc ccc ttt acg ctc Ala Pro Asn Gln Phe Arg Asn Pro Glu Gly Glu Leu Pro Phe Thr Leu 225	230	235	720
cct gac cta tcc gag tca gaa att gtg gtt ccg gag gaa cag aaa gga Pro Asp Leu Ser Glu Ser Glu Ile Val Val Pro Glu Glu Gln Lys Gly 245	250	255	768
cgt gcg cat ccc cag gtg ata ccc gag ggt gcg cca cgt gga ctg caa Arg Ala His Pro Gln Val Ile Pro Glu Gly Ala Pro Arg Gly Leu Gln 260	265	270	816
cct ggt gaa tac tac gta cag att gca gtc ttt cat gac gct atc cag Pro Gly Glu Tyr Tyr Val Gln Ile Ala Val Phe His Asp Ala Ile Gln 275	280	285	864
gtg cag agc att gtc cac cgt tac ggg gta gaa tac ccc atc gca gtg Val Gln Ser Ile Val His Arg Tyr Gly Val Glu Tyr Pro Ile Ala Val 290	295	300	912
gag cag gac atc cat gaa ggt aag gtg cgt ttc acc gta tgc gtc ggt Glu Gln Asp Ile His Glu Gly Lys Val Arg Phe Thr Val Cys Val Gly 305	310	315	960
cct gtc caa aaa gac gaa cgc ggc gcg gta cta gag aac ttc caa agg Pro Val Gln Lys Asp Glu Arg Gly Ala Val Leu Glu Asn Phe Gln Arg 325	330	335	1008
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Ala Gly Ile Pro Gly Leu Leu Val Ser Leu Ala Pro Ala Ala Ala Ala 35                     40                    45			

Gln Leu Gly Ile Gly Val Tyr Gln Ala Val Arg Val Arg Val Arg Thr  
50 55 60

Leu Gly Thr Val Arg Gly Gly Ser Gln Thr Ser Gln Asp Gly Leu Ser  
65 70 75 80

Leu Ala Ser Leu Pro Ser Arg Val Pro Ala Arg Pro Ala Gln Arg Asp  
85 90 95

Pro Leu Ser Ser Pro Pro Ala Gly His Thr Val Pro Glu Tyr Arg Asp  
100 105 110

Thr Val Ile Phe Asp Asp Pro Arg Leu Val Ser Pro Leu Ser Arg Glu  
115 120 125

Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly  
130 135 140

Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser  
145 150 155 160

Glu Arg Glu Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val  
165 170 175

Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg Glu Val Glu Asp Val  
180 185 190

Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg Glu  
195 200 205

Val Ala Ser Gln His Thr Lys Gln Pro Ser His Ser Val Ser Asn Ser  
210 215 220

Ala Pro Asn Gln Phe Arg Asn Pro Glu Gly Glu Leu Pro Phe Thr Leu  
225 230 235 240

Pro Asp Leu Ser Glu Ser Glu Ile Val Val Pro Glu Glu Gln Lys Gly  
245 250 255

Arg Ala His Pro Gln Val Ile Pro Glu Gly Ala Pro Arg Gly Leu Gln  
260 265 270

Pro Gly Glu Tyr Tyr Val Gln Ile Ala Val Phe His Asp Ala Ile Gln  
275 280 285

Val	Gln	Ser	Ile	Val	His	Arg	Tyr	Gly	Val	Glu	Tyr	Pro	Ile	Ala	Val	
290				295						300						
Glu	Gln	Asp	Ile	His	Glu	Gly	Lys	Val	Arg	Phe	Thr	Val	Cys	Val	Gly	
305				310				315				320				
Pro	Val	Gln	Lys	Asp	Glu	Arg	Gly	Ala	Val	Leu	Glu	Asn	Phe	Gln	Arg	
				325				330				335				
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Met																
1							5				10			15		
agc	aac	tta	gaa	aag	aat	gcc	aag	gct	cag	gca	gtg	gtt	att	ggg	cac	96
Ser	Asn	Leu	Glu	Lys	Asn	Ala	Lys	Ala	Gln	Ala	Val	Val	Ile	Gly	His	
							20				25			30		
gca	ggg	atc	ccc	ggt	ctt	cta	gtt	agc	ctt	gca	ccc	gct	gct	gca	gca	144
Ala	Gly	Ile	Pro	Gly	Leu	Leu	Val	Ser	Leu	Ala	Pro	Ala	Ala	Ala	Ala	
							35			40			45			
cag	ctt	ggg	att	ggc	gta	tac	caa	gct	gtg	cgt	gta	cgc	gta	cgt	acc	192
Gln	Leu	Gly	Ile	Gly	Val	Tyr	Gln	Ala	Val	Arg	Val	Arg	Val	Arg	Thr	
							50			55			60			
ttg	ggt	acc	gtg	cgc	ggt	ggg	tct	caa	aca	agt	cag	gac	gga	ctg	tcc	240
Leu	Gly	Thr	Val	Arg	Gly	Gly	Ser	Gln	Thr	Ser	Gln	Asp	Gly	Leu	Ser	
							65			70			75		80	
ctt	gca	tct	ttg	ccg	tcc	cgt	gtg	cct	gcg	cgc	ccc	gcg	cag	cgt	gat	288
Leu	Ala	Ser	Leu	Pro	Ser	Arg	Val	Pro	Ala	Arg	Pro	Ala	Gln	Arg	Asp	
							85			90			95			
cct	ctg	tca	tcc	ccg	ccg	gca	ggt	cac	act	gta	ccg	gaa	tat	cgc	gat	336
Pro	Leu	Ser	Ser	Pro	Pro	Ala	Gly	His	Thr	Val	Pro	Glu	Tyr	Arg	Asp	
							100			105			110			

acg gtt att ttc gat gac ccg cgt ttg gtt tcc cct ttg tct cgt gag	384
Thr Val Ile Phe Asp Asp Pro Arg Leu Val Ser Pro Leu Ser Arg Glu	
115 120 125	
gtg gag gac gtg ccg aag gta gtg gag ccg gcc tct gag cgt gag gga	432
Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly	
130 135 140	
ggg gag cgt gag gtg gag gac gtg ccg aag gta gtg gag ccg gcc tct	480
Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser	
145 150 155 160	
gag cgt gag gga ggg gag cgt gag gtg gag gac gtg ccg aag gta gtg	528
Glu Arg Glu Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val	
165 170 175	
gag ccg gcc tct gag cgt gag gga ggg gag cgt gag gtg gag gac gtg	576
Glu Pro Ala Ser Glu Arg Glu Gly Glu Arg Glu Val Glu Asp Val	
180 185 190	
ccg aag gta gtg gag ccg gcc tct gag cgt gag gga ggg gag cgt gag	624
Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly Glu Arg Glu	
195 200 205	
gtg gag gac gtg ccg aag gta gtg gag ccg gcc tct gag cgt gag gga	672
Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly	
210 215 220	
ggg gag cgt gag gtg gag gac gtg ccg aag gta gtg gag ccg gcc tct	720
Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser	
225 230 235 240	
gag cgt gag gga ggg gag cgt gag gtg gag gac gtg ccg aag gta gtg	768
Glu Arg Glu Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val	
245 250 255	
gag ccg gcc tct gag cgt gag gga ggg gag cgt gag gtg gag gac gtg	816
Glu Pro Ala Ser Glu Arg Glu Gly Glu Arg Glu Val Glu Asp Val	
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Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly Glu Arg Glu	
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gtc gct tct cag cat acg aag cag cca tcc cac tcg gtt tcc aac tca	912
Val Ala Ser Gln His Thr Lys Gln Pro Ser His Ser Val Ser Asn Ser	
290 295 300	
gct ccc aat cag ttt cgg aac cct gag ggg gaa ctc ccc ttt acg ctc	960
Ala Pro Asn Gln Phe Arg Asn Pro Glu Gly Glu Leu Pro Phe Thr Leu	
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cct gac cta tcc gag tca gaa att gtg gtt ccg gag gaa cag aaa gga	1008
Pro Asp Leu Ser Glu Ser Glu Ile Val Val Pro Glu Glu Gln Lys Gly	
325 330 335	
cgt gcg cat ccc cag gtg ata ccc gag ggt gcg cca cgt gga ctg caa	1056
Arg Ala His Pro Gln Val Ile Pro Glu Gly Ala Pro Arg Gly Leu Gln	
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Pro	Val	Gln	Lys	Asp	Glu	Arg	Gly	Ala	Val	Leu	Glu	Asn	Phe	Gln	Arg	
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Ala	Gly	Ile	Pro	Gly	Leu	Leu	Val	Ser	Leu	Ala	Pro	Ala	Ala	Ala	Ala	
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Gln	Leu	Gly	Ile	Gly	Val	Tyr	Gln	Ala	Val	Arg	Val	Arg	Val	Arg	Thr	
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Leu	Gly	Thr	Val	Arg	Gly	Gly	Ser	Gln	Thr	Ser	Gln	Asp	Gly	Leu	Ser	
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Leu	Ala	Ser	Leu	Pro	Ser	Arg	Val	Pro	Ala	Arg	Pro	Ala	Gln	Arg	Asp	
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Pro	Leu	Ser	Ser	Pro	Pro	Ala	Gly	His	Thr	Val	Pro	Glu	Tyr	Arg	Asp	
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Thr	Val	Ile	Phe	Asp	Asp	Pro	Arg	Leu	Val	Ser	Pro	Leu	Ser	Arg	Glu	
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Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg Glu Val Glu Asp Val  
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Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg Glu  
195 200 205

Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly  
210 215 220

Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val Glu Pro Ala Ser  
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Glu Arg Glu Gly Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val  
245 250 255

Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg Glu Val Glu Asp Val  
260 265 270

Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg Glu  
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Val Ala Ser Gln His Thr Lys Gln Pro Ser His Ser Val Ser Asn Ser  
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Ala Pro Asn Gln Phe Arg Asn Pro Glu Gly Glu Leu Pro Phe Thr Leu  
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Pro Asp Leu Ser Glu Ser Glu Ile Val Val Pro Glu Glu Gln Lys Gly  
325 330 335

Arg Ala His Pro Gln Val Ile Pro Glu Gly Ala Pro Arg Gly Leu Gln  
340 345 350

Pro Gly Glu Tyr Tyr Val Gln Ile Ala Val Phe His Asp Ala Ile Gln  
355 360 365

Val Gln Ser Ile Val His Arg Tyr Gly Val Glu Tyr Pro Ile Ala Val																																																																																																												
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380																																																																																																												
Glu Gln Asp Ile His Glu Gly Lys Val Arg Phe Thr Val Cys Val Gly																																																																																																												
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Pro Val Gln Lys Asp Glu Arg Gly Ala Val Leu Glu Asn Phe Gln Arg																																																																																																												
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Gln His Thr Lys Gln Pro Ser His Ser Val Ser Asn Ser Ala Pro Asn	
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Val Pro Lys Val Val Glu Pro Ala Ser Glu Arg Glu Gly Gly Glu Arg  
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Gly Gly Glu Arg Glu Val Glu Asp Val Pro Lys Val Val Glu Pro Ala  
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Gln His Thr Lys Gln Pro Ser His Ser Val Ser Asn Ser Ala Pro Asn  
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Gln Phe Arg Asn Pro Glu Gly Glu Leu Pro Phe Thr Leu Pro Asp Leu  
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Pro Gln Val Ile Pro Glu Gly Ala Pro Arg Gly Leu Gln Pro Gly Glu  
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Tyr Tyr Val Gln Ile Ala Val Phe His Asp Ala Ile Gln Val Gln Ser  
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Ile Val His Arg Tyr Gly Val Glu Tyr Pro Ile Ala Val Glu Gln Asp  
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Ile His Glu Gly Lys Val Arg Phe Thr Val Cys Val Gly Pro Val Gln  
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Lys Asp Glu Arg Gly Ala Val Leu Glu Asn Phe Gln Arg Phe Gly Phe  
370                    375                    380

Lys Asp Ala Phe Leu Lys Lys Ala Arg  
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